Mathematics People

Mirzakhani Receives 2009 Blumenthal Award

The Leonard M. and Eleanor B. Blumenthal Award for the Advancement of Research in Pure Mathematics has been presented to MARYAM MIRZAKHANI of Princeton University. The award was presented at the Joint Mathematics Meetings in Washington, DC in January 2009.

Citation

The Leonard M. and Eleanor B. Blumenthal Trust Award for the Advancement of Research in Pure Mathematics is awarded to Maryam Mirzakhani for her exceptionally creative, highly original thesis. This work combines tools as diverse as hyperbolic geometry, "classical methods" of automorphic forms, and symplectic reduction to obtain results on three different important questions. These results include a recursive formula for Weil-Petersson volumes of moduli spaces of Riemann surfaces, a determination of the asymptotics of the number of simple closed geodesics on a hyperbolic surface in terms of length, and a new proof of Witten's Conjecture (originally established by Kontsevich) establishing the KdV recursion for the intersection numbers on moduli space.

Biographical Sketch

Maryam Mirzakhani obtained her B.Sc. in mathematics (1999) from the Sharif University of Technology in Tehran, Iran. She holds a Ph.D. from Harvard University (2004), where her advisor was Curtis McMullen. From 2004 to 2008 she was a Clay Mathematics Institute Research Fellow. She is a professor at Princeton University. Her research interests include Teichmüller theory, hyperbolic geometry, and ergodic theory.

Response from Mirzakhani

I am deeply honored to be a recipient of the Leonard M. and Eleanor B. Blumenthal Award.

First, I would like to thank my Ph.D. advisor, Curt McMullen, for introducing me to many fascinating areas of mathematics and for his invaluable help and encouragement throughout all these years. I am also grateful to the math department at Harvard University and all my graduate school teachers for providing a great environment for graduate students. I want to express my gratitude to my teachers at Sharif University of Technology for showing me the beauty of mathematics. I am gratefully indebted to my many friends in the Boston area, especially Roya Beheshti, whose friendship has been a source of happiness and inspiration for me.

Finally, I thank my family for all their unceasing love and support.

About the Award

The Leonard M. and Eleanor B. Blumenthal Trust for the Advancement of Mathematics was created for the purpose of assisting the Department of Mathematics of the University of Missouri at Columbia, where Leonard Blumenthal served as professor for many years. Its second purpose is to recognize distinguished achievements in the field of mathematics through the Leonard M. and Eleanor B. Blumenthal Award for the Advancement of Research in Pure Mathematics, which was originally funded from the Eleanor B. Blumenthal Trust (dated September 24, 1984) upon Mrs. Blumenthal's death on July 12, 1987.

The trust, which is administered by the Financial Management and Trust Services Division of Boone County National Bank in Columbia, Missouri, pays its net income to the recipient of the award each year for four years. The recipient is selected by a committee of five members, each of whom has made notable contributions to mathematics. The award is presented to the individual deemed to have made the most substantial contribution to research in the field of pure mathematics and who is deemed to have the potential for future production of distinguished research in the field. To fulfill these criteria, the prize committee has decided to grant the award for the most substantial Ph.D. thesis produced in the four-year interval between awards.

Previous recipients of the Blumenthal Award are Manjul Bhargava (2005), Stephen J. Bigelow and Elon B. Lindenstrauss (2001), Loïc Merel (1997), and Zhihong Xia (1993).

—AMS Announcement

Gamburd Receives PECASE Award

ALEXANDER GAMBURD of the University of California, Santa Cruz, has been chosen to receive a 2007 Presidential Early Career Award for Scientists and Engineers (PECASE) for his work in the mathematical sciences. Gamburd was

nominated by the Division of Mathematical Sciences of the National Science Foundation. He was one of sixty-eight young researchers to receive the award, the highest honor bestowed by the U.S. government on outstanding young scientists, mathematicians, and engineers who are in the early stages of establishing their independent research.

The recipients were selected from nominations made by eight participating federal agencies. Each awardee receives a five-year grant ranging from US$400,000 to nearly US$1 million to further his or her research and educational efforts.

—From an NSF announcement

Klartag and Naor Awarded Salem Prize

Bo'az Klartag of Tel Aviv University and Assaf Naor of the Courant Institute of Mathematical Sciences, New York University, have been awarded the 2008 Salem Prize. Klartag was honored for his work in high-dimensional convexity and the local theory of Banach spaces. Naor was recognized for his contributions to the structural theory of metric spaces and its applications to computer science.

The Salem Prize is awarded every year to a young mathematician judged to have done outstanding work in the field of interest of Raphael Salem, primarily the theory of Fourier series.

—Jean Bourgain, Institute for Advanced Study

AAAS Fellows Chosen

Six mathematicians have been elected as new fellows to the Section on Mathematics of the American Association for the Advancement of Science (AAAS). In addition, four researchers whose work involves the mathematical sciences have been elected to the Section on Information, Computing, and Communication. The new fellows in the Section on Mathematics are: Walter Craig, McMaster University; Robert J. Daverman, University of Tennessee, Knoxville; Richard Durrett, Cornell University; Alexander Nagel, University of Wisconsin; Jacob Rubinstein, Technion-Israel Institute of Technology; and William Y. Velez, University of Arizona. The new fellows in the Section on Information, Computing, and Communication are: Chandrajit Bajaj, University of Texas at Austin; Alan Kay, Viewpoints Research Institute; Daniel E. Koditschek, University of Pennsylvania; and Dexter Kozen, Cornell University.

—From an AAAS announcement

A. O. L. Atkin (1923–2008)

A. O. L. (Oliver) Atkin was born in Liverpool, England. He attended Winchester College and the University of Cambridge. He spent the last year of the Second World War at Bletchley Park, where he was one of the many mathematicians and linguists who broke a variety of German ciphers. He returned to Cambridge in 1947 and received his doctorate in 1952. He moved to the United States in 1970 and joined the faculty of the University of Illinois at Chicago Circle (now the University of Illinois at Chicago) in 1972.

Atkin is especially well known for his paper with J. Lehner, "Hecke operators on $\Gamma_0(M)$", *Math. Annalen* **185**, pp. 134–160. This paper introduced the notion of "newform" in the theory of modular forms. As a result of that paper, Atkin's name is attached to the important U-operator in the Hecke theory of modular forms. He continued this work with Winnie Li in subsequent papers.

Atkin made a number of early observations about congruences among modular forms that were fundamental in the later development of the theory of p-adic modular forms. He did important work on partitions.

Atkin was a pioneer in the application of computers to mathematics. He spent several years in England at the Atlas Computer Laboratory. For background on his contributions during that period, see Bryan Birch's article "Atkin and the Atlas Lab" in *Computational Perspectives on Number Theory: Proceedings of a Conference in Honor of A. O. L. Atkin* (D. A. Buell and J. T. Teitelbaum, editors, AMS/IP Studies in Advanced Mathematics, Volume 7, 1998).

Many mathematicians relied on him for numerical data in support of their conjectures; he seemed to have a personal acquaintance with every modular form of relatively low weight and level.

His more recent work included taking an idea of René Schoof on an approach to computing points on elliptic curves mod p and making it practical; after further refinements by Noam Elkies this algorithm is now known as SEA (for Schoof-Elkies-Atkin). He and Dan Bernstein found an improvement to the Sieve of Eratosthenes, now known as the "sieve of Atkin". Together with Morain, Atkin developed a powerful primality test using CM elliptic curves. In practical terms this test is arguably the most efficient currently available.

Especially later in his career, Atkin was not fond of publishing papers in journals and typically made his results known via the NMBRTHRY email list.

He was a fine pianist and organist and a champion duplicate bridge player.

He remained mathematically active until his death and was continuing to work on problems about modular forms for noncongruence subgroups with Winnie Li and her students. He first raised this topic with Swinnerton-Dyer thirty years ago.

He is survived by a son and daughter and five grandchildren.

—Jeremy Teitelbaum, University of Connecticut